DOOSAN

Optimal Solutions for the Future

PUMA ST series

A highly rigid Swiss type turning center, excellent for continuous precision machining

PUMA ST series

PUMA ST20/32G
PUMA ST20/26/32/35GS

ver. EN 150915 SU

PUMA ST series

The PUMA ST series models are Swiss type turning centers developed by Doosan's technology that originally created the world-famous brand PUMA. The PUMA ST series machines are designed to provide high reliability and precision, and work with various types of special tooling to achieve very high productivity.

Excellent Rigidity and Precision

- Designed with FEM analysis to provide high stability and productivity.
- Precision machining capability is further improved due to minimal thermal error design.

Provide a Tool Solution Applicable for a Diversity of Machining Processes

- Suitable for processing small parts having diameters between Ø20 ~ Ø35mm.
- Up to 5 cross tools can be used for highest efficiency in milling and other special machining processes.

User-Friendly Software for Easy Set-up and Operation

- Doosan's built-in software provides various user convenience functions for easy operation and control.
- Productivity is further improved by the reduced time of setup and operation.

Contents

G series Premium class

Division	PUMA ST20G	PUMA ST32G
		
Max. machining diameter	Ø20 mm (0.8 inch)	Ø32 mm (1.3 inch)
No. Mountable tools (Max.)	25 (30) ea	24 (29) ea
Cross tool	5 ea	4 ea
CNC	FANUC 31i	FANUC 31i

GS series Standard class

Division	PUMA ST20GS	PUMA ST26GS	PUMA ST32GS	PUMA ST35GS
				
Max. machining diameter	Ø20 mm (0.8 inch)	Ø26 mm (1.0 inch)	Ø32 mm (1.3 inch)	Ø35 mm (1.4 inch)
No. Mountable tools (Max.)	24 (29) ea	22 (27) ea	24 (29) ea	21 (26) ea
Cross tool	4 ea	5 ea	4 ea	4 ea
CNC	DOOSAN FANUC i	DOOSAN FANUC i	DOOSAN FANUC i	DOOSAN FANUC i

PUMA ST20G / 32G

The PUMA ST20G / 32G spindle guide bush and chucking system are precisely controlled by servo motor and the latest FANUC 31i CNC as standard to optimise machining accuracy.

Major specifications

Description	Unit	PUMA ST20G
Controll axes	-	7 (X1,Z1,C1,Y,X2,Z2,C2)
Max. machining length	mm (inch)	200 (7.9)
Max. spindle power (30min/cont.)	kW (Hp)	Main : 3.7 / 2.2 (5.0 / 3.0) Sub : 2.2 / 1.5 (3.0 / 2.0)
Machine dimensions (L x W x H)	mm (inch)	2300 x 1245 x 1735 (90.6 x 49.0 x 68.3)
Display unit	inch	10.4
CNC	-	FANUC 31i

PUMA ST20G

Max. Machining Diameter

ø20mm
(Ø0.8 inch)

Max. spindle speed

Main Spindle: **10000 r/min**

Sub-Spindle: **8000 r/min**

Major specifications

Description	Unit	PUMA ST32G
Controll axes	-	7 (X1,Z1,C1,Y,X2,Z2,C2)
Max. machining length	mm (inch)	320 (12.6)
Max. spindle power (30min/cont.)	kW (Hp)	Main : 7.5 / 5.5 (10.1 / 7.4) Sub : 3.7 / 2.2 (5.0 / 3.0)
Machine dimensions (L x W x H)	mm (inch)	2630 x 1400 x 1850 (103.5 x 55.1 x 72.8)
Display unit	inch	10.4
CNC	-	FANUC 31i

PUMA ST32G

Max. Machining Diameter

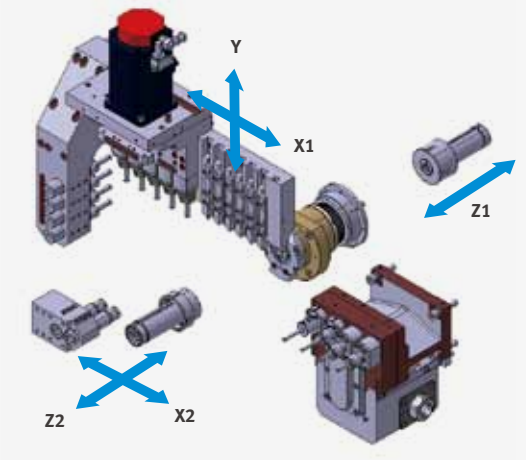
ø32mm
(Ø1.3 inch)

Max. spindle speed

Main Spindle: **8000 r/min**

Sub-Spindle: **8000 r/min**

PUMA ST20G



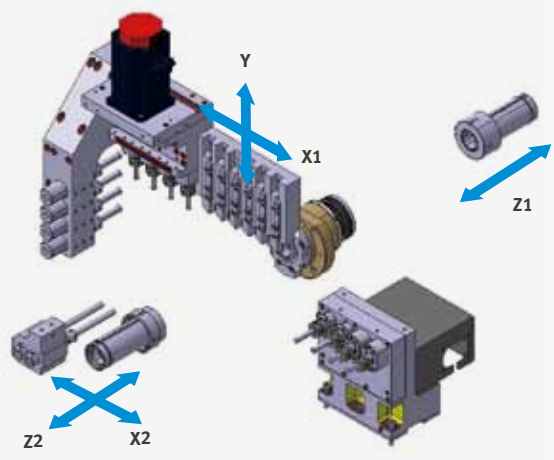
Travel

Description	Unit	Z1	X1	Y	Z2	X2
Travel distance	mm (inch)	200 (7.9)	90 (3.5)	386 (15.2)	190 (7.5)	345 (13.6)
Rapid traverse rate	m/min (ipm)	32 (1259.8)				

Tool

Description		Unit	PUMA ST20G
No. Mountable tools (Max)		ea	25 (30)
Front machining	Turning tool	ea	6 (12 x 12 x 120)
	Sleeve holder		4 (ER16M) (+4, bifacial)
	Cross tool		5 (ER16)
Back machining	Number of mountable tool	ea	fixed 2 + rotation 2
	Additional fixed type tool		2
Deep hole	Number of mountable tool	ea	2

PUMA ST32G



Travel

Description	Unit	Z1	X1	Y	Z2	X2
Travel distance	mm (inch)	320 (12.6)	114 (4.5)	404 (15.9)	305 (12.0)	393 (15.5)
Rapid traverse rate	m/min (ipm)	32 (1259.8)				

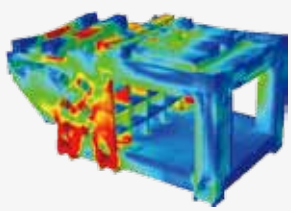
Tool

Description		Unit	PUMA ST32G
No. Mountable tools (Max)		ea	24 (29)
Front machining	Turning tool	ea	6 (16 x 16 x 120)
	Sleeve holder		4 (ER20M) (+4, bifacial)
	Cross tool		4 (ER16)
Back machining	Number of mountable tool	ea	fixed 2 + rotation 2
	Additional fixed type tool		2
Deep hole	Number of mountable tool	ea	2

PUMA ST-G series Features Highlight

Bed Structure

Designed via structural analysis, the bed improves rigidity and minimizes thermal error due to its integrated type structure.



Servo-controlled Guide Bushes

The guide bush and main spindle are synchronized by servo motor for high precision control and easy maintenance. Minimized vibration further increases machining accuracy.

Servo-controlled Chucking System

The tension of the collet chuck is controlled by servo motor. This system maintains constant tension for precise and stable setting. The setting up can easily be done with short-cut keys and Doosan's EOP function on the screen.

Automatic Collet chuck
Tension Control Function

Built-in Sub Spindle

The main and sub spindles use built in motors to minimize vibration and noise, resulting in high accuracy. The main and sub spindles can be controlled by fast and precise synchronization, improving machining accuracy, and allows easy maintenance without affecting belt life and accuracy.

* PUMA 20G (Standard), 32G option

PUMA ST20GS / 26GS

The PUMA ST20GS / 26GS provide stable, continuous cutting accuracy due to minimized thermal error design.

Major specifications

Description	Unit	PUMA ST20GS	PUMA ST26GS
Controll axes	-	7 (X1,Z1,C1,Y,X2,Z2,C2)	
Max. machining length	mm (inch)	200 (7.9)	
Max. spindle power (30min/cont.)	kW (Hp)	Main : 3.7 / 2.2 (5.0 / 3.0) Sub : 2.2 / 1.5 (3.0 / 2.0)	Main : 5.5 / 2.2 (7.4 / 3.0) Sub : 2.2 / 1.5 (3.0 / 2.0)
Machine dimensions (L x W x H)	mm (inch)	2210 x 1225 x 1730 (87.0 x 48.2 x 68.1)	2320 x 1245 x 1780 (91.3 x 49.0 x 70.1)
Display unit	inch	8.4	
CNC		DOOSAN FANUC i	

PUMA ST20GS

Max. Machining Diameter

ø20mm (Ø0.8 inch)

Max. spindle speed

Main Spindle: **10000 r/min**

Sub-Spindle: **8000 r/min**

PUMA ST26GS

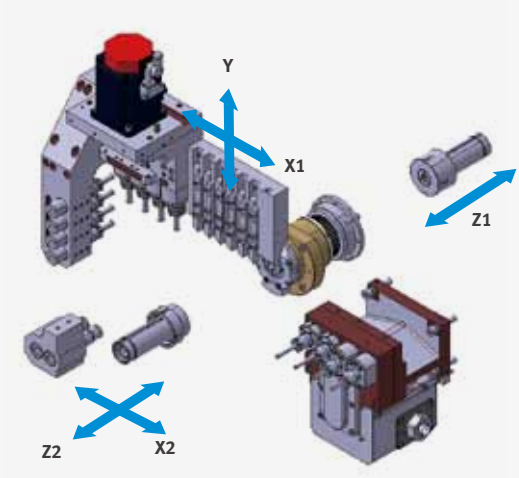
Max. Machining Diameter

ø26mm (Ø1.0 inch)

Max. spindle speed

Main Spindle: **8000 r/min**

Sub-Spindle: **8000 r/min**



Travel

Description	Unit	Z1	X1	Y	Z2	X2
Travel distance (PUMA ST20GS)	mm (inch)	200 (7.9)	90 (3.5)	350 (13.8)	190 (7.5)	345 (13.6)
Travel distance (PUMA ST26GS)	mm (inch)	200 (7.9)	90 (3.5)	386 (15.2)	186 (7.3)	345 (13.6)
Rapid traverse rate	m/min (ipm)	32 (1259.8)				

Tool

Description		Unit	PUMA ST20GS	PUMA ST26GS
No. Mountable tools (Max)		ea	24 (29)	22 (27)
Front machining	Turning tool	ea	6 (12 x 12 x 120)	5 (16 x 16 x 120)
	Sleeve holder		4 (ER16M) (+4,bifacial)	4 (ER16) (+4,bifacial)
	Cross tool		4 (ER16M)	5 (ER16)
Back machining	Number of mountable tool	ea	fixed 2+rotation 2	fixed 2+rotation 2
	Additional fixed type tool		2	2
Deep hole	Number of mountable tool	ea	2	X

PUMA ST GS series Features Highlight

Built-in Sub Spindle option

The PUMA ST GS series models provide a built-in sub spindle as an option. The main and sub spindles can be controlled by fast and precise synchronization, improving machining accuracy and allows easy maintenance without affecting belt life and accuracy.

* Standard feature for the PUMA ST26GS

Back Tool Post for 6 Tools option

The Back tool post can hold up to 6 tools to improve efficiency and productivity.

Standard Specification
Fixed 2ea, rotary 2ea

PUMA ST32GS / PUMA ST35GS

The spindle chucking capacity of the PUMA ST32GS / 35GS is suitable for heavy-duty cutting of large-sized parts. These models are suitable for processing the parts for automotive, hydraulic, and pneumatic applications.

Major specifications

Description	Unit	PUMA ST32GS	PUMA ST35GS
Controll axes	-	7 (X1,Z1,C1,Y,X2,Z2,C2)	
Max. machining length	mm (inch)	300 (11.8)	
Max. spindle power (30min/cont.)	kW	Main : 7.5 / 5.5 (10.1 / 7.4) Sub : 3.7 / 2.2 (5.0 / 3.0)	Main : 7.5 / 5.5 (10.1 / 7.4) Sub : 3.7 / 2.2 (5.0 / 3.0)
Machine dimensions (L x W x H)	mm (inch)	2630 x 1400 x 1850 (103.5 x 55.1 x 72.8)	2630 x 1400 x 1850 (103.5 x 55.1 x 72.8)
Display unit	inch	8.4	10.4
CNC		DOOSAN FANUC i	

PUMA ST32GS

Max. Machining Diameter

ø32mm (Ø1.3 inch)

Max. spindle speed

Main Spindle: **8000 r/min**

Sub-Spindle: **8000 r/min**

PUMA ST35GS

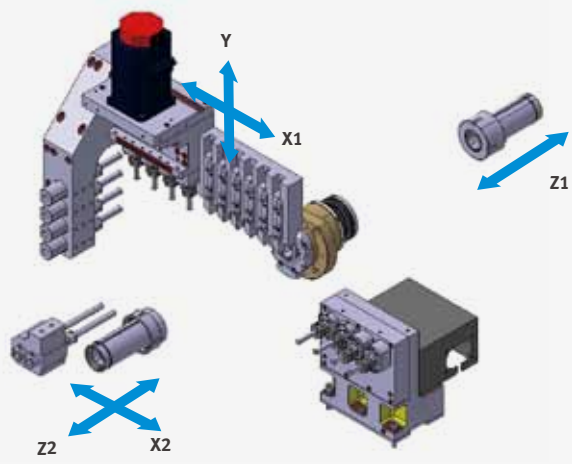
Max. Machining Diameter

ø35mm (Ø1.4 inch)

Max. spindle speed

Main Spindle: **8000 r/min**

Sub-Spindle: **8000 r/min**



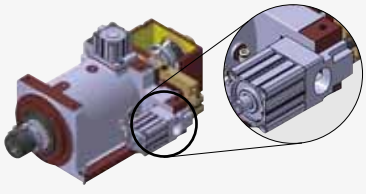
Travel

Description	Unit	Z1	X1	Y	Z2	X2
Travel distance (PUMA ST32GS)	mm (inch)	300 (11.8)	114 (4.5)	404 (15.9)	305 (12.0)	393 (15.5)
Travel distance (PUMA ST35GS)	mm (inch)	300 (11.8)	114 (4.5)	404 (15.9)	305 (12.0)	393 (15.5)
Rapid traverse rate	m/min (ipm)	32 (1259.8)				

Tool

Description		Unit	PUMA ST32GS	PUMA ST35GS
No. Mountable tools (Max)		ea	24 (29)	21 (26)
Front machining	Turning tool	ea	6 (16 x 16 x 120)	5 (16 x 16 x 120)
	Sleeve holder		4 (ER20M) (+4,bifacial)	4 (ER20M) (+4,bifacial)
	Cross tool		4 (ER16)	4 (ER16)
Back machining	Number of mountable tool	ea	fixed 2 + rotation 2	fixed 2 + rotation 2
	Additional fixed type tool		2	2
Deep hole	Number of mountable tool	ea	2	X

PUMA ST GS series Features Highlight



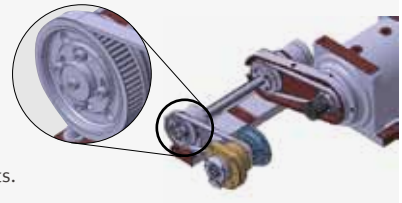
Chucking System Driven with Air Cylinder

The chucking system of the PUMA ST GS series is driven by air cylinder for simple structure and easy maintenance.

Guide Bush

The PUMA ST GS series models use mechanical, ball spline type guide bush.

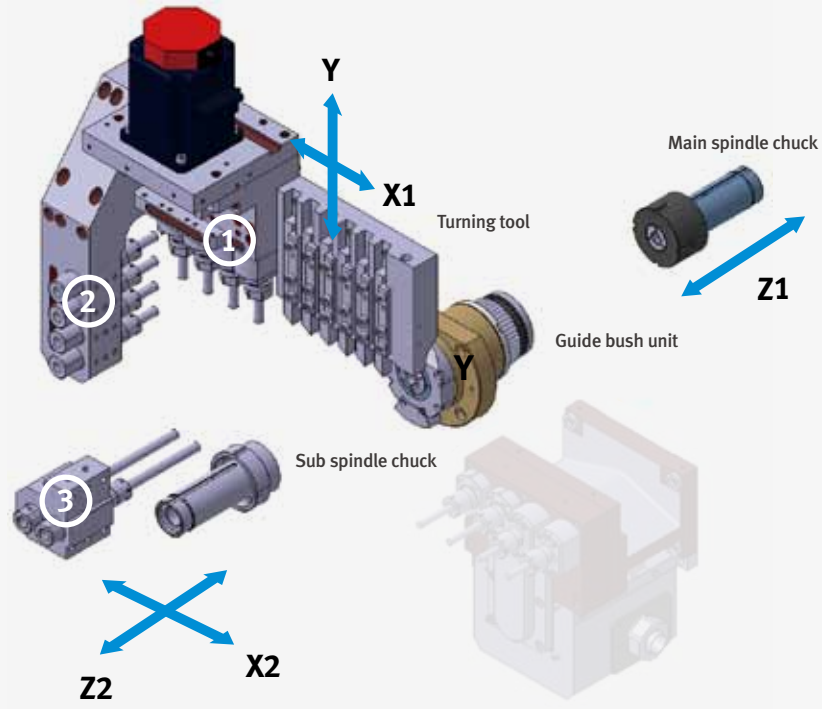
* Beneficial for cutting profile parts.



Machining

The PUMA ST series are designed to adopt various tooling options. Customers can choose optimal tooling to achieve highest level of productivity.

Front Machining



1. Cross Rotary Tool Holder

Cross Rotary Tool Holder

2. Sleeve Holder

Double Sleeve

Sleeve

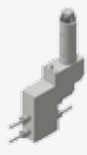
3. Deep Hole Cutting Sleeve Holder

Deep Hole Sleeve

* Except for PUMA ST26GS / 35GS

Cross Tools for Special Cutting

2 Spindle Unit

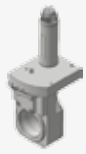


2 Spindle Counter Face Unit

3 Spindle Unit

Polygon Unit

Slotting Unit



Thread Whirling Unit

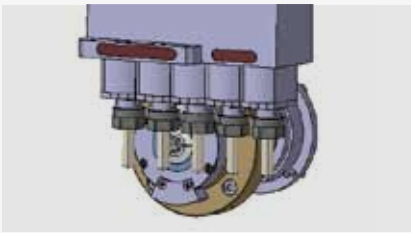
2-Spindle Adjustable Angle Unit

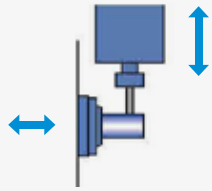
3-Spindle Adjustable Angle Unit

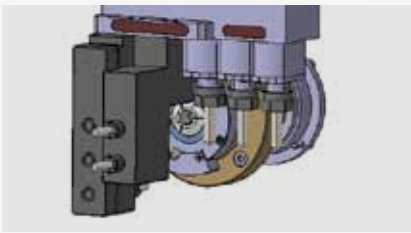
Front Machining

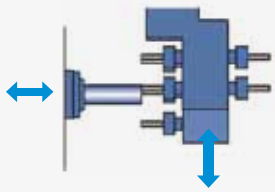
Cross Tool Drilling / Milling Hole Cutting

Drilling, rigid tapping and milling in radial direction using rotary tools.







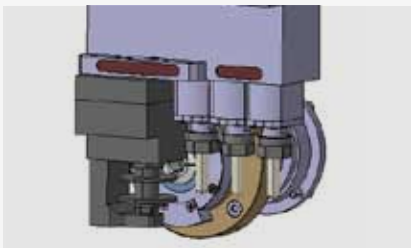


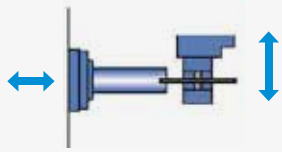
Special Cutting Function (Helical Interpolation) option

This function provides helical paths for tools by issuing instructions to other axes in synchronization with circular interpolation. When it is necessary to process a hole bigger than the machine specification, this is especially useful for cutting the hole with cross tools.

Face Slotting

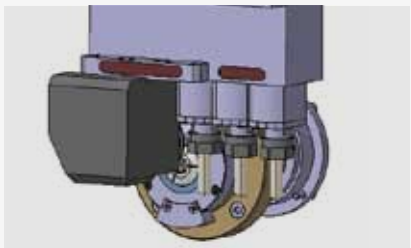
Slotting in the longitudinal direction on the main side

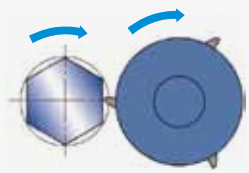




Polygonal Turning

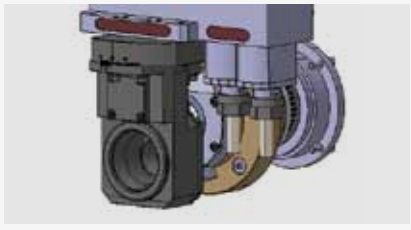
A polygon can be processed in a single cycle using a polygon cutter.

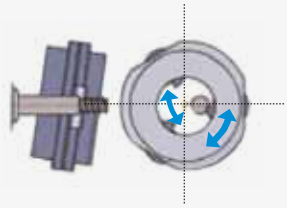




Thread Whirling

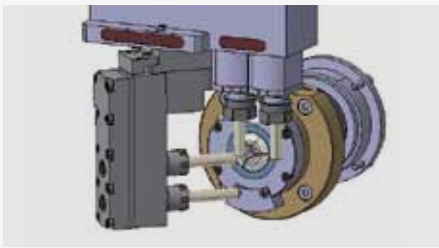
Thread cutting using a rotary tool and the C-axis by setting-up a whirling holder at the rotary tool unit on the main side.

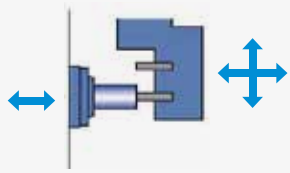


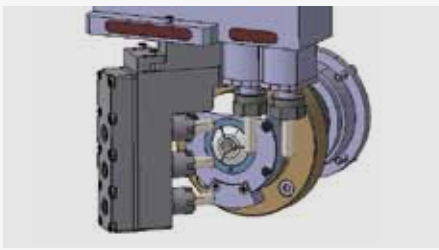


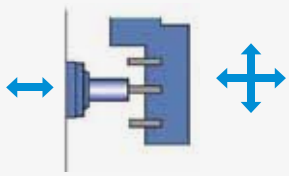
Drilling / Milling Hole Cutting with Angle Adjustment

Drilling, rigid tapping and milling by adjusting the angle of the tool in the longitudinal direction on the main side.

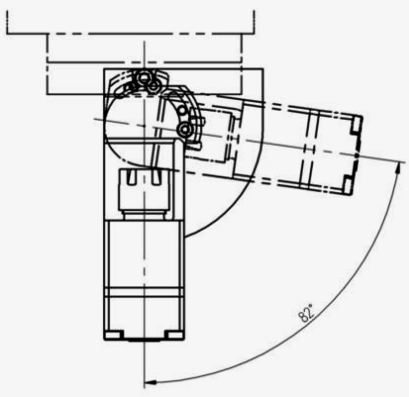




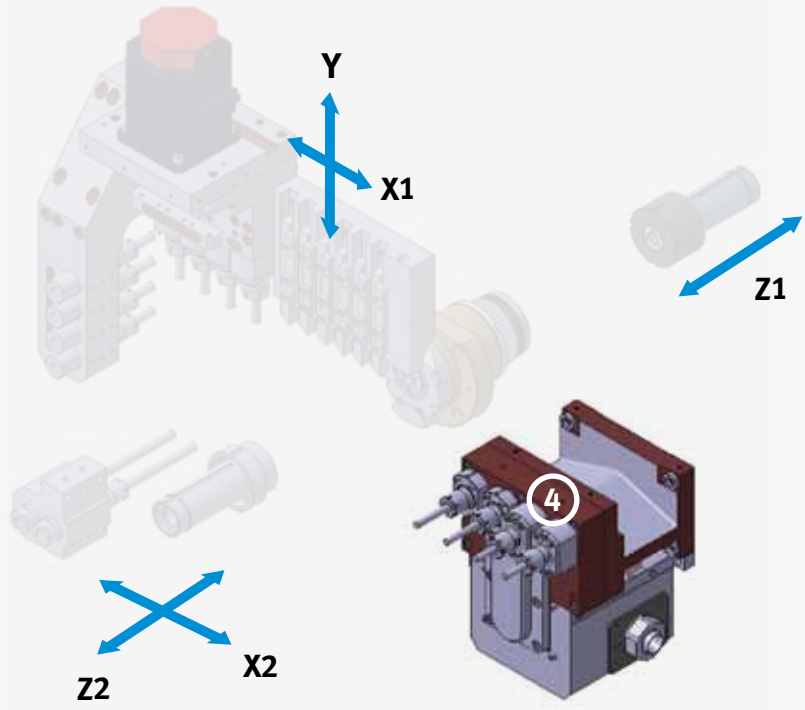




Adjustable up to 82 degrees in the left and right to enable complicated hole cutting.



Back Machining



4. Back Tools


Back Sleeve Holder


Back Bite Holder

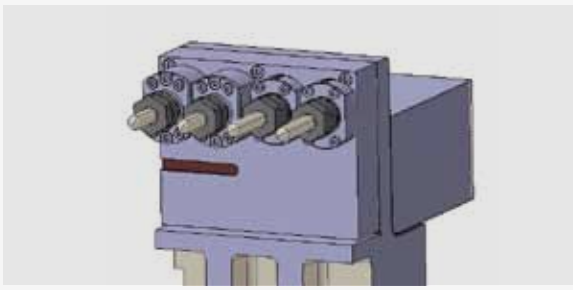

Back Slotting Unit

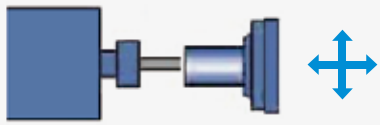

Back Sleeve


Back Tool Holder

Back Drilling / Milling Hole Cutting

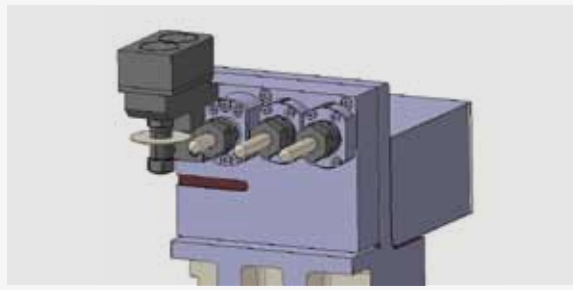
Off-center drilling, rigid tapping and end milling using reverse rotating tools.

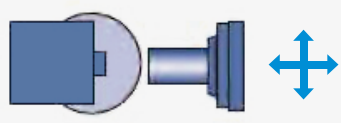




Back Slotting

Slotting using a slotting tool mounted on a reverse rotating tool.





Standard / Optional Specifications

Diverse optional features are available for customer-specific work applications.

● Standard ○ Optional X N/A

NO.	Description	Features	G series		GS series			
			PUMA ST20G	PUMA ST32G	PUMA ST20GS	PUMA ST26GS	PUMA ST32GS	PUMA ST35GS
1	Collet Chuck Size (Main / Sub)	None	●	●	●	●	●	●
2		Ø5~Ø20	○	○	○	○	○	○
3		Ø21~Ø26	X	○	X	○	○	○
4		Ø27~Ø32	X	○	X	X	○	○
5		Ø33~Ø35	X	X	X	X	X	○
6	Gudie Bush Chuck Size	None	●	●	●	●	●	●
7		Ø5~Ø20	○	○	○	○	○	○
8		Ø21~Ø26	X	○	X	○	○	○
9		Ø27~Ø32	X	○	X	X	○	○
10		Ø33~Ø35	X	X	X	X	X	○
11	Coolant Pump (60 / 50Hz)	1.5 bar	●	●	●	●	●	●
12		15 / 30 / 70bar	○	○	○	○	○	○
13	Coolant Options	Coolant Flow Rate Detector	●	●	●	●	●	●
14		TSC(Through Spindle Coolnat) For Sub / Right Spindle	○	○	○	○	○	○
15		High Coolant Interface	○	○	○	○	○	○
16	Chip Processing Options	Hinged Belt_Left Side (Height:800mm)	○	○	○	○	○	○
17		Hinged Belt_Left Side (Height:1M)	○	○	○	○	○	○
18		Chip Bucket (90L / 110L / 220L / 300L)	○	○	○	○	○	○
19	Measurement & Automation	Cut Off Tool Breakage Detector	●	●	●	●	X	X
20		Parts Ejector (Air Cylinder Type)	X	X	X	X	●	●
21		Workpiece Ejector W/Spring	●	●	●	●	●	●
22		Rear Workpiece Ejector	○	○	○	○	○	○
23		Parts Conveyor	○	○	○	○	○	○
24		Bar Feeder	●	●	●	●	●	●
25		Drill Broken Detector	○	○	○	○	○	○
26	Attachable Tools	Main T/P Gang (Turning)	●	●	●	●	●	●
27		Main T/P Cross Drill	●	●	●	●	●	●
28		Main T/P Sleeve Holder	●	●	●	●	●	●
29		Cross Drill Holder 2Spd	○	○	○	○	○	○
30		Cross Drill Holder 2Spd Conter Face	○	○	○	○	○	○
31		Cross Drill Holder 3Spd	○	○	○	○	○	○
32		Cross Drill Holder Polygon	○	○	○	○	○	○
33		Cross Drill Holder Slotting	○	○	○	○	○	○
34		Cross Drill Holder Tw	○	○	○	○	○	○
35		Cross Drill Holder 2Spd Adjustable Angel	○	○	○	○	○	○
36		Cross Drill Holder 3Spd Adjustable Angel	○	○	○	○	○	○
37		Dr Sleeve (Er16 STD)	X	X	X	○	○	X
38		Dr Sleeve (Er16 Counter Face)	X	X	○	○	○	X
39		Br Sleeve D6 / D8	○	○	○	○	○	○
40		Br Sleeve D10	○	○	X	X	X	○
41		Slotting Back Tool Holder	○	○	○	○	○	○
42		Back Br Sleeve D6 / D8	○	○	○	○	○	○
43		Back Tool Attach_Fixed_2EA	○	○	○	○	○	○
44		Back Tool Attachment_Bite	○	○	○	○	○	○
45		Deep Hole Sleeve	○	○	○	X	○	X
46	Optional Devices	Signal Tower	●	●	●	●	●	●
47		Led Work Light	●	●	●	●	●	●
48		Fire Extinguisher (Auto)	○	○	○	○	○	○
49		Mist Collector	○	○	○	○	○	○
50		Electric Line Filter	○	○	○	○	○	○
51		Extra M Code (4EA)	○	○	○	○	○	○
52		Automatic Power Off	○	○	○	○	○	○
53		Shunt Trip Coil	○	○	○	○	○	○

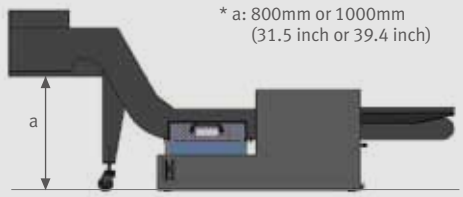
* For further details of the range of options, please contact Doosan.

Peripheral Equipment

Chip Removal Options

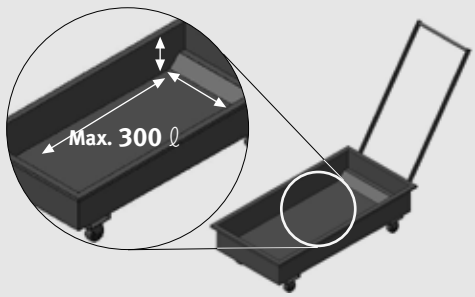
Chip Conveyor option

A hinged-type chip conveyor is employed, with chip discharger height selectable by the customer requirements.



Chip Bucket option

Chips can be disposed of conveniently using a chip bucket, whose size can be determined according to the convenience of the customer.



With chip conveyor:
110 ℓ , 220 ℓ and 300 ℓ

Without conveyor:
90 ℓ

Coolant System

Coolant Pump option

The customer can select coolant pressure from: 15 / 30 / 70 bar.

*15 Bar

*30 / 70 Bar

TSC option

A TSC (Through Spindle Coolant) type coolant spray system is available for efficient chips disposal.

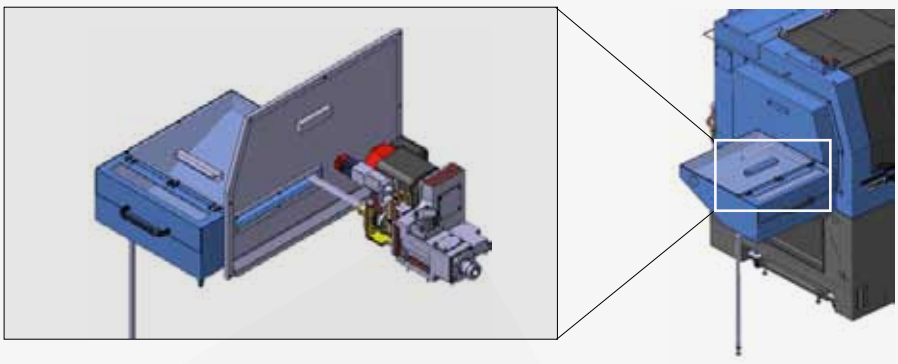
High Pressure Coolant Interface option

The customer can select additional electric wiring interface for using high pressure coolant.

Measurement & Automation

Back Work-piece Disposal System option

For the rear chip disposal system, the box size is increased and the cover is re-designed to protect the operator and environment by preventing coolant spray.

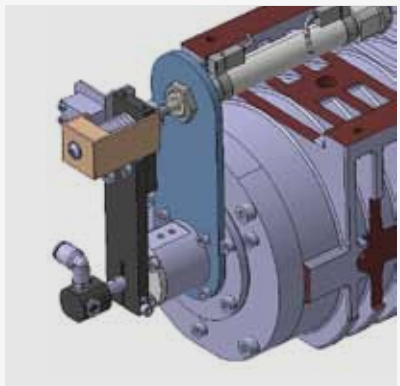


The pipe penetrating through the sub spindle is made of brass to minimize damage to the work. Various materials for discharge pipe are available to meet customer's requirements.

	PUMA ST20G / GS	PUMA ST26GS	PUMA ST32G / GS	PUMAST35GS
Ø11	○	○	○	○
Ø17	○	○	○	○
Ø20	○	○	○	○
Ø23	X	○	X	X
Ø25	X	X	○	○
Ø32	X	X	○	○

Work Ejector

Air cylinder type and spring type work ejectors are available for customer's choice.



Air cylinder type

Spring type option

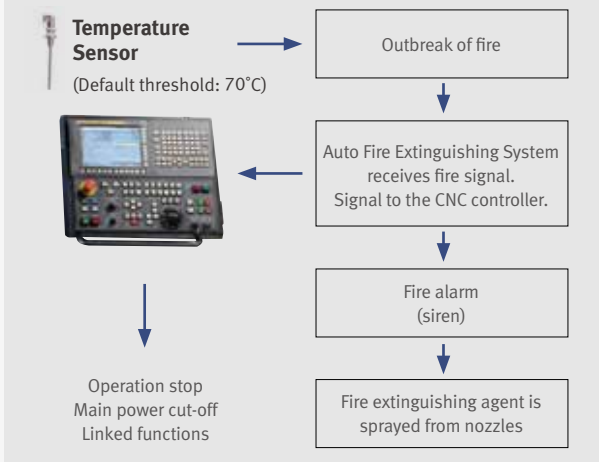
Accessories

Auto Fire Extinguishing System option

When the fire is detected by temperature sensors, an alarm is triggered and carbon dioxide fire extinguishing system is activated automatically.

* Please ask to local distributor about fire extinguishing system, because of difference fire defense regulation by each country.

Auto Fire Extinguishing System



Mist Collector option

A mist collector is provided to remove coolant and dust and provide pleasant work environment.

FANUC

FANUC CNC optimized for DOOSAN's machine tools maximizes users' productivity.

User-Friendly Operation Panel

PUMA ST G series
10.4" Color LCD

PUMA ST GS series
8.4" Color LCD
10.4" Color LCD option

USB & PCMCIA Card
- Slant design for user convenience
- Short-cut keys for easier setup and operation

Easy Operation Package

Easier and simpler screens are continuously being developed for pre-process setup, machine check-ups, cutting, and other operations.

User convenience software functionality

Short-cut buttons on the operation panel for user convenience →

Preparation for Operation: Machine check-up and pre-setting

Machine Check-up

Displays the conditions of the machine and the interface to the peripheral equipment.

Tool Information

Tool layout information is displayed in 3D graphic, enabling easy setup of optional tools.

Manual Handle Retrace

Operator can use manual function to execute the program forward or backward.

Cutting and Count-up Setting Function

Information window for cutting operation (diameter & length of work, tool number, spindle's rotating direction, feed, etc.)

Preparation for Operation: Machine check-up and pre-setting

Tool Geometry Offset Setting

Shows geometry values of individual tool.

Auto Collet chuck Adjust

A patented technology which greatly reduces tension adjustment time by easily setting up the tension of the main/sub collet at an appropriate torque.

* Available for PUMA ST G series only.

Cycle Setting Function

A screen where the user conducts basic setups for machine operation within the cycle set.

Auto Cut-off Function

Using a hot key, the operator can cut off work piece without using extra macro or programming. Reduced setup time leads to reduced preparation time.

Tool Life Management Function

The usage info of each tool is counted for easier management of tools. Tool life can be managed with this function without additional hardware.

Programming Code Help Function

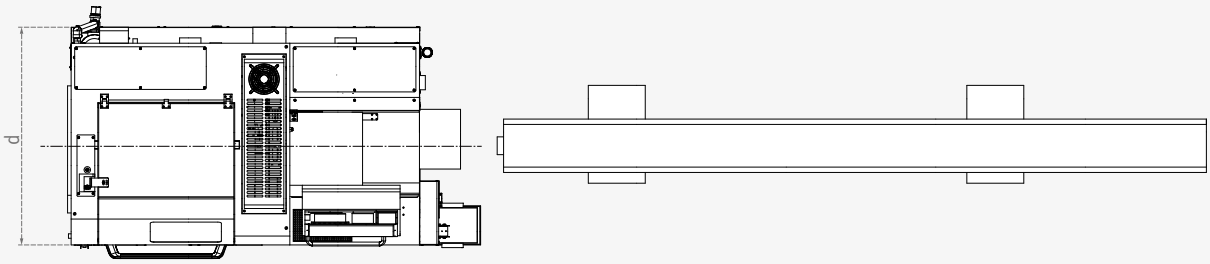
The description on the method and conditions for using G and M codes are provided to help the operator to run the machine with minimal effort and time.

Machine Dimensions

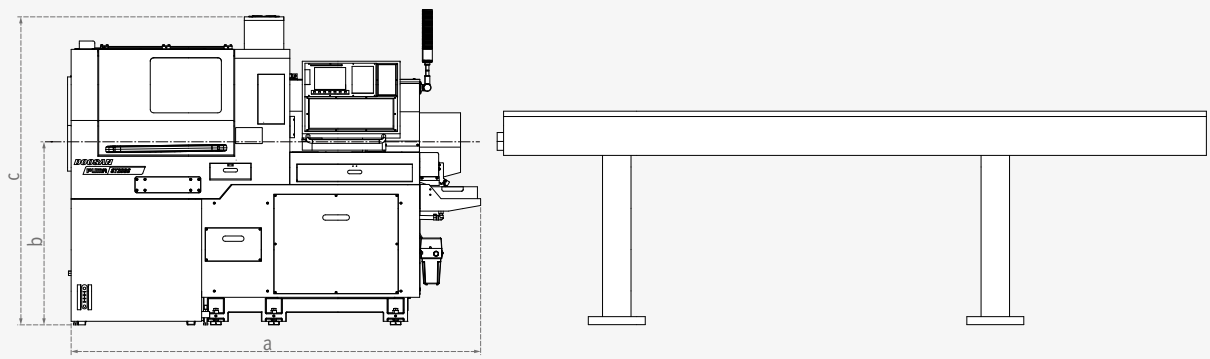
PUMA ST series

Unit: mm (inch)

Top View



Front View



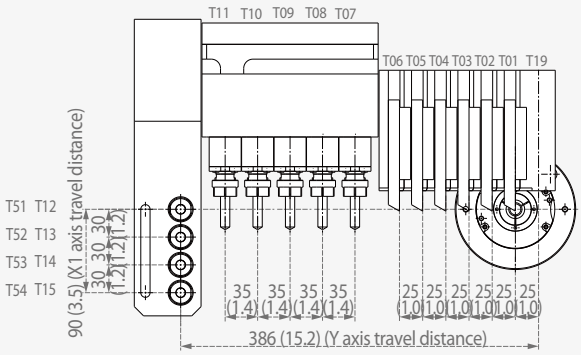
Division	Unit	PUMA ST20G	PUMA ST32G	PUMA ST20GS	PUMA ST26GS	PUMA ST32GS	PUMA ST35GS
Length (a)	mm (inch)	2300 (90.6)	2630 (103.5)	2210 (87.0)	2320 (91.3)	2630 (103.5)	2630 (103.5)
Center height (b)	mm (inch)	1050 (41.3)	1060 (41.7)	1050 (41.3)	1050 (41.3)	1060 (41.7)	1060 (41.7)
Height (c)	mm (inch)	1735 (68.3)	1850 (72.8)	1730 (68.1)	1780 (70.1)	1850 (72.8)	1850 (72.8)
Width (d)	mm (inch)	1245 (49.0)	1400 (55.1)	1225 (48.2)	1245 (49.0)	1400 (55.1)	1400 (55.1)

PUMA ST20G / ST32G

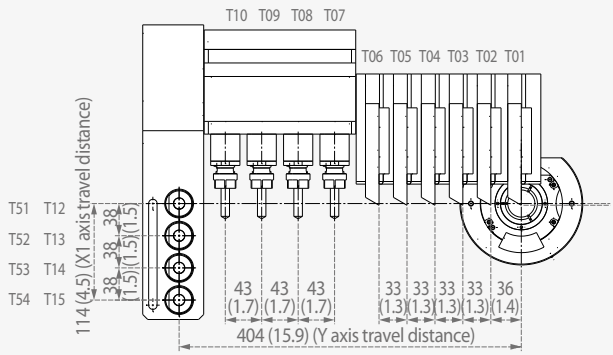
Unit: mm (inch)

Front Tools

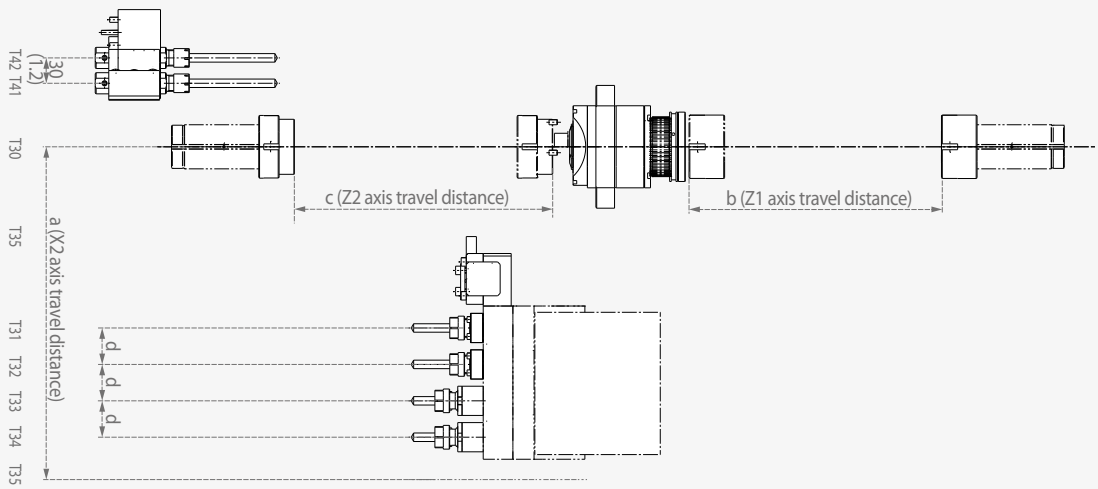
PUMA ST20G



PUMA ST32G



Back Tools



Division	Unit	PUMA ST20G	PUMA ST32G
X2 axis travel distance (a)	mm (inch)	345 (13.6)	393 (15.5)
Z1 axis travel distance (b)	mm (inch)	200 (7.9)	320 (12.6)
Z2 axis travel distance (c)	mm (inch)	190 (7.5)	305 (12.0)
Distance between back tools (d)	mm (inch)	41 (1.6)	43 (1.7)

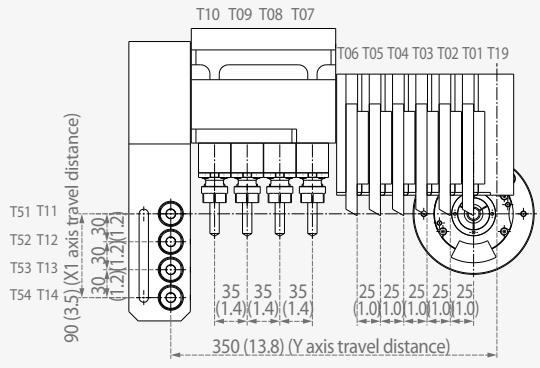
Tooling System

PUMA ST20GS / 26GS

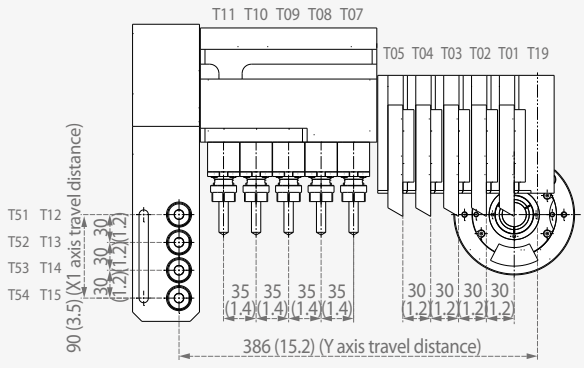
Unit: mm (inch)

Front Tools

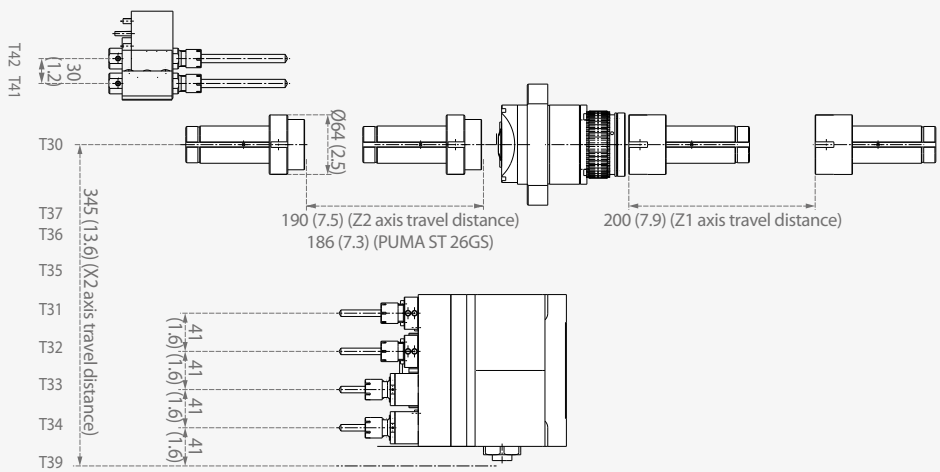
PUMA ST20GS



PUMA ST26GS



Back Tools



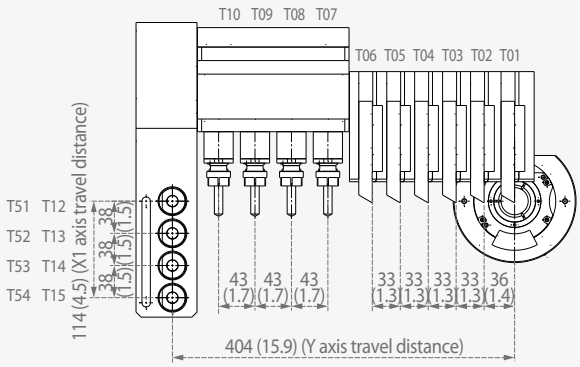
* T41,T42 Except PUMA ST26GS

PUMA ST32GS / ST35GS

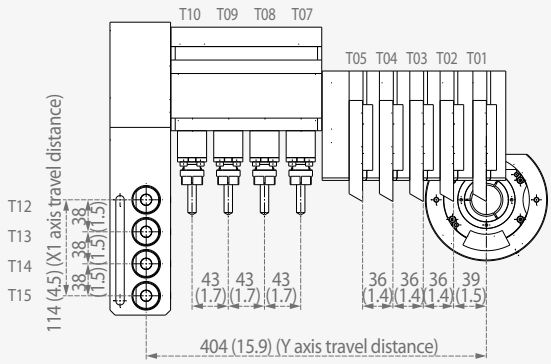
Unit: mm (inch)

Front Tools

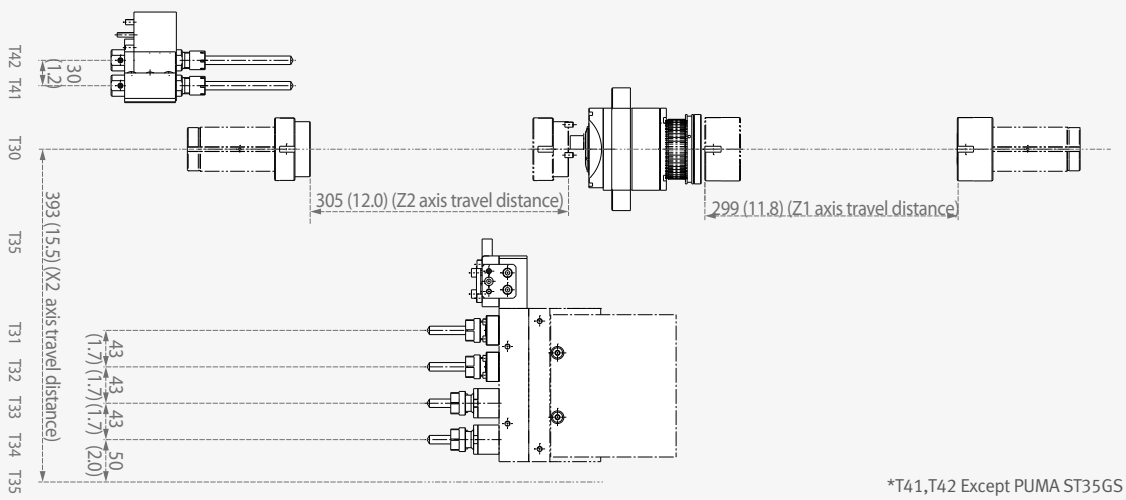
PUMA ST32GS



PUMA ST35GS



Back Tools



*T41,T42 Except PUMA ST35GS

Machine Specifications

Description			Unit	G series		GS series			
				PUMA ST20G	PUMA ST32G	PUMA ST20GS	PUMA ST26GS	PUMA ST32GS	PUMA ST35GS
Machining Capacity	Max. machining diameter		mm (inch)	Ø20 (0.8)	Ø32 (1.3)	Ø20 (0.8)	Ø26 (1.0)	Ø32 (1.3)	Ø35 (1.4)
	Max. machining length		mm (inch)	200 (7.9)	320 (12.6)	200 (7.9)	200 (7.9)	300 (11.8)	300 (11.8)
	Max. front drilling / tap		mm (inch)	Ø10 / M8 (0.4 / M0.3)	Ø13 / M12 (0.5 / M0.5)	Ø10 / M8 (0.4 / M0.3)	Ø10 / M8 (0.4 / M0.3)	Ø13 / M12 (0.5 / M0.5)	Ø13 / M12 (0.5 / M0.5)
	Max. cross drill / tap		mm (inch)	Ø8 / M6 (0.3 / M0.2)					
Tool post	No. Mountable tools (Max)			25 (30)	24 (29)	24 (29)	22 (27)	24 (29)	21 (26)
	Front machining	Turning tool	ea	6(12x12 x120)	6 (16 x16 x120)	6 (12x12 x120)	5 (16x16 x120)	6 (16x16 x120)	5 (16x16 x120)
		Sleeve holder		4 (ER16M)	4 (ER20M)	4 (ER16M)	4 (ER16)	4 (ER20M)	4 (ER20M)
		Cross tool		5 (ER16)	4 (ER16)	4 (ER16M)	5 (ER16)	4 (ER16)	4 (ER16)
		Max. rotaty tool speed	r/min	8000					
	Back machining	Number of mountable tool	ea	fixed 2 + rotation 2					
		Additional fixed type tool	ea	2					
		Max. rotaty tool speed	r/min	6000	8000	6000	6000	8000	8000
Spindle	Main spindle	Max. spindle speed	r/min	10000	8000	10000	8000	8000	8000
		Max. spindle power (30min/cont.)	kW (Hp)	3.7 / 2.2 (5.0 / 3.0)	7.5 / 5.5 (10.1 / 7.4)	3.7 / 2.2 (5.0 / 3.0)	5.5 / 2.2 (7.4 / 3.0)	7.5 / 5.5 (10.1 / 7.4)	7.5 / 5.5 (10.1 / 7.4)
	Sub spindle	Max. spindle speed	r/min	8000					
		Max. spindle power (30min/cont.)	kW (Hp)	2.2 / 1.5 (3.0 / 2.0)	3.7 / 2.2 (5.0 / 3.0)	2.2 / 1.5 (3.0 / 2.0)	2.2 / 1.5 (3.0 / 2.0)	3.7 / 2.2 (5.0 / 3.0)	3.7 / 2.2 (5.0 / 3.0)
	C-axis minimum indixing increment			0.001					
Travel	Rapid traverse rate		m/min (ipm)	32 (1259.8)					
	X1, X2, Z1, Z2, Y motor power		kW (Hp)	0.75 (1.0)	1.0 (1.3)	0.5 (0.7)	0.75 (1.0)	1.0 (1.3)	1.0 (1.3)
Chuck / Guide bush	Main/sub spindle			TF25	TF37	TF25	TF32	TF37	TF40
	Guide bush			TD25NS	TD32S	TD25NS	CD25	TD32S	TD35
Power source	Power consumption		Kva	15	22	12	22	22	22
Control	NC system			FANUC 31i		DOOSAN FANUC i			

NC Unit Specifications

FANUC

● Standard ○ Optional X Not applicable

No	Division	Item	Spec.	FANUC 31i	DOOSAN FANUC i
1	Control axes	Controlled axes		7(X1,Z1,Y,C1, X2,Z2,C2)	7(X1,Z1,Y,C1, X2,Z2,C2)
2		Synchronous / Composite control		●	●
3		Torque control		●	●
4		Inch / metric conversion		●	●
5		Stored limit check before move		●	●
6		Unexpected disturbance torque detection function		●	●
7		Position switch		●	●
8	Operation	DNC operation with memory card		●	●
9		Handle interruption		●	○
10		Manual handle retrace		●	●
11	Interpolation	Nano interpolation		●	●
12		Linear interpolation		●	●
13		Circular interpolation		●	●
14		Helical interpolation		○	○
15		Thread cutting, synchronous cutting		●	●
16		Thread cutting retract		●	●
17		Continuous threading		●	●
18		High-speed skip	Input signal is 8 points.	○	○
19		2nd reference position return	G30	●	●
20		3rd/4th reference position return		●	○
21	Feeding	Override cancel		●	●
22		AI contour control I		●	●
23		AI contour control II		X	○
24		Rapid traverse block overlap		●	●
25	Programming	Optional block skip	9 pieces	X	X
26		Absolute / incremental programming	Combined use in the same block	●	●
27		Diameter / Radius programming		●	●
28		Automatic coordinate system setting		●	●
29		Workpiece coordinate system	G52 - G59	●	X
30		Chamfering / Corner R		●	●
31		Custom macro		●	●
32		Addition of custom macro common variables	#100 - #199, #500 - #999	●	X
33		Interruption type custom macro		●	○
34		Canned cycle		●	●
35		Multiple repetitive cycles	G70~G76	●	●
36		Multiple repetitive cycles II	Pocket profile	●	●
37		Canned cycle for drilling		●	●
38		Coordinate system shift		●	●
39		Direct input of coordinate system shift		●	●
40	Auxiliary / Spindle function	Constant surface speed control		●	●
41		Rigid tap		●	●
43	Tool function / Tool compensation	Tool offset pairs	64-pairs	●	●
44		Tool radius / Tool nose radius compensation		●	●
45		Tool geometry / wear compensation		●	X
46		Automatic tool offset		●	X
47		Direct input of offset value measured B		●	X
48		Tool life management		●	X
49	Accuracy compensation functions	Backlash compensation for each rapid traverse and cutting feed		●	●
50	Data input / output	Fast data server		X	○
51		External data input		●	●
52		Memory card input / output		●	●
53		USB memory input / output		●	●
54		Automatic data backup		●	●
55	Interfacing	Embedded Ethernet		●	●
56		Fast Ethernet		X	○
57	Other functions	Display unit	8.4” color LCD	X	●
58			10.4” color LCD	●	○

Responding to Customers Anytime, Anywhere

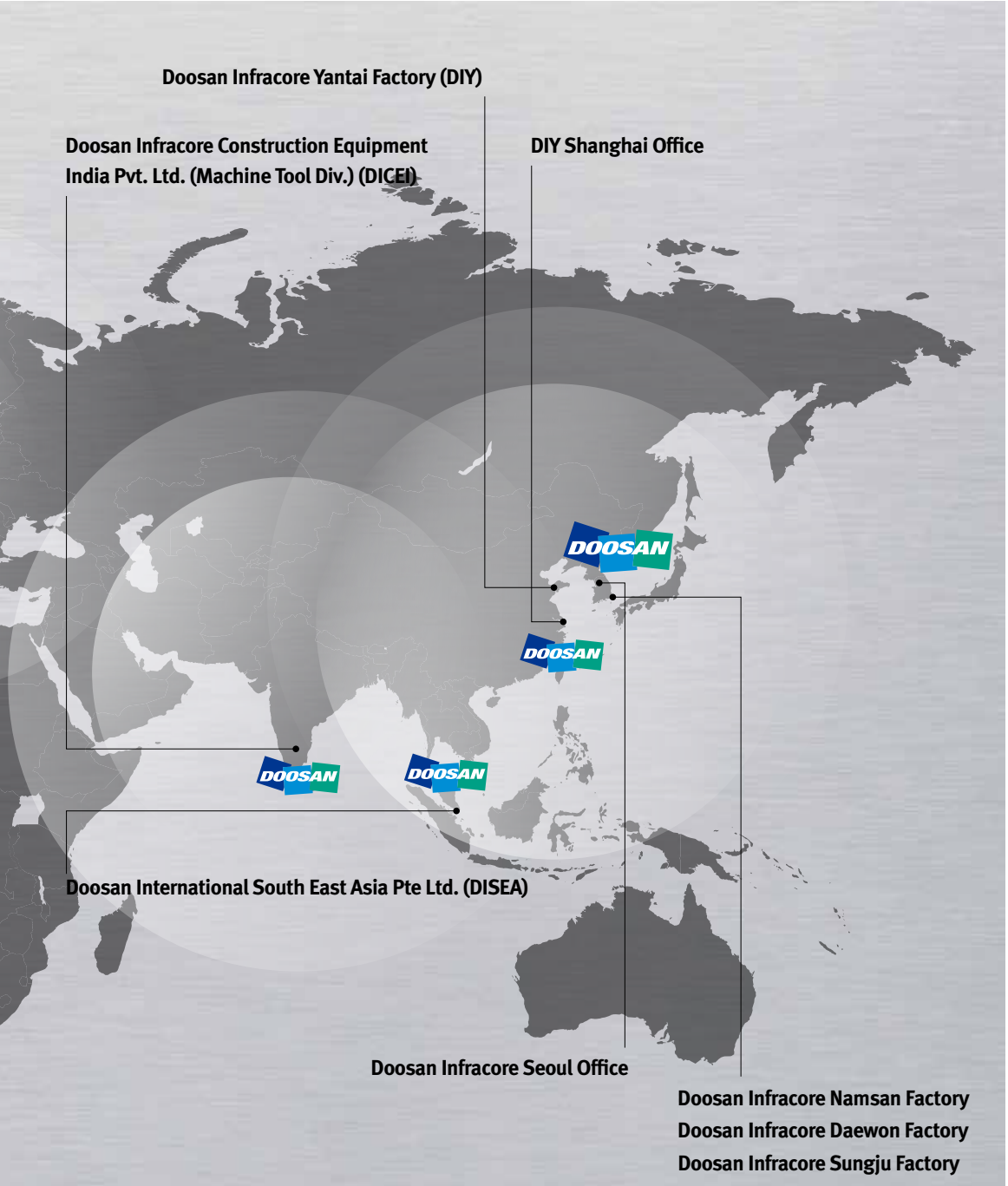
Global Service Support Network

Corporations	Dealer Networks	Technical Centers	Factories
5	128	21	4

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Domestic Service Support Network

Integrated Support Centers	Sales Branch Offices	Post-Sales Service Centers	Designated Repair Service Centers
2	7	6	31

Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

PUMA ST series

Specification			UNIT	G series		GS series			
				PUMA ST20G	PUMA ST32G	PUMA ST20GS	PUMA ST26GS	PUMA ST32GS	PUMA ST35GS
Machining Capacity	Max. machining diameter		mm (inch)	Ø20 (0.8)	Ø32 (1.3)	Ø20 (0.8)	Ø26 (1.0)	Ø32 (1.3)	Ø35 (1.4)
Spindle	Max. spindle power (30min/cont.)	Main	kW (Hp)	3.7 / 2.2 (5.0 / 3.0)	7.5 /5.5 (10.1 / 7.4)	3.7 / 2.2 (5.0 / 3.0)	5.5 / 2.2 (7.4 / 3.0)	7.5 /5.5 (10.1 / 7.4)	7.5 /5.5 (10.1 / 7.4)
		Sub		2.2 / 1.5 (3.0 / 2.0)	3.7 / 2.2 (5.0 / 3.0)	2.2 / 1.5 (3.0 / 2.0)	2.2 / 1.5 (3.0 / 2.0)	3.7 / 2.2 (5.0 / 3.0)	3.7 / 2.2 (5.0 / 3.0)
Tool post	No. Mountable tools (Max)		ea	25 (30)	24 (29)	24 (29)	22 (27)	24 (29)	21 (26)
	Front machining	Turning tool	ea	6	6	6	5	6	5
		Sleeve holder		4+4	4+4	4+4	4+4	4+4	4+4
		Cross tool		5	4	4	5	4	4
	Back machining	Number of mountable tool	ea	4	4	4	4	4	4
		Additional fixed type tool		2	2	2	2	2	2
Travel	Rapid traverse rate		m/min (ipm)	32 (1259.8)					
Control	Control axes		-	7 (X1,Z1,C1,Y,X2,Z2,C2)					
	NC system		-	FANUC 31i		DOOSAN FANUC i			

Doosan Machine Tools

http://www.doosanmachinetools.com

Optimal Solutions for the Future

Head Office
Doosan Tower 20th FL., 275, Jangchungdan-Ro (St), Jung-Gu, Seoul
Tel +82-2-3398-8693 / 8671 / 8680
Fax +82-2-3398-8699

Doosan Infracore America Corp.
19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.
Tel +1-973-618-2500
Fax +1-973-618-2501

Doosan Infracore Germany GmbH
Emdener Strasse 24, D-41540 Dormagen, Germany
Tel +49-2133-5067-100
Fax +49-2133-5067-001

Doosan Infracore Yantai Co., LTD
13 Building, 140 Tianlin Road, Xuhui District, Shanghai, China (200233)
Tel +86-21-6440-3384 (808, 805)
Fax +86-21-6440-3389

Doosan Infracore Construction Equipment India Pvt. Ltd. (Machine Tool Div.)
106 / 10-11-12, Amruthahalli, Byatarayanapura, Bellary road, Bangalore-560 092, India
Tel +91-80-4266-0122 / 121 / 100

Doosan International South East Asia Pte Ltd.
42 Benoi Road, Jurong 629903, Singapore
Tel +65-6499-0200
Fax +65-6861-3459

* For more details, please contact Doosan.
* The specifications and information above-mentioned may be changed without prior notice.